

EXHIBIT 19



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RO-6-152

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Dan Silver, Executive Director
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8424 Santa Monica Blvd., Suite A 592
Los Angeles, CA 90069-4267

Subject: Fire risk impacts of Otay Ranch Village 14 and Planning Areas 16/19 Project

Dear Mr. Silver,

At your request, I have reviewed San Diego County's responses to my 12 April 2018 comments on the Draft Environmental Impact Report (DEIR) and Fire Protection Plan (FPP) for the planned Otay Ranch Village 14 and Planning Areas 16/19 Project. The County has taken the position that the subject Fire Protection Plan need only address the impact of fires spreading from adjacent areas into the Project Area, and not the potential impact from fires igniting within the Project Area and spreading to adjacent communities. In response O-6.4-34, San Diego County states "The Fire Protection Plan process in San Diego County does not specifically address the potential for increased risk to adjacent communities." The inherent deficiency with this reasoning is perhaps better illustrated by a simple example: applying this same reasoning to chemical plant design, it would be acceptable to design a chemical plant that exposes downwind communities to toxic chemicals as long as that chemical plant is designed so that that workers at the plant are not exposed to those same toxic chemicals.

Also in response O-6.4.34, the County notes that the FPP "followed the County-established format and focused on documenting the Proposed Project's compliance with fire and building codes." Compliance with codes and standards is the bare minimum required under the law – and meeting this bare minimum required legally does not guarantee safety. The RMS Titanic complied with all codes and standards. As an old adage in Fire Protection Engineering goes - lawyers can make anything legal, but only engineers can make them safe.

One of the primary themes of my 12 April 2018 letter was that under Santa Ana wind conditions, the Otay Ranch Village 14 and Planning Areas 16/19 project greatly increases the risk of structure losses and loss of life in communities downwind of the planned development (e.g., Chula Vista) due to increased ignition probability within the Project Area. The EIR and FPP are deficient because they do not address the potential for increased fire risk in the Project vicinity, independent of whether the County considers this to be within the scope of the FPP. In short, the EIR and the FPP fail to disclose that the Project would be a source of ignitions that would increase fire risk in the area. Compliance with building codes (e.g., ignition resistant structures), implementation of fuel modification zones, and construction of a fire station are insufficient to

offset increased risk associated with new ignitions that will accompany the project. With that in mind, I provide sur-responses to the County's responses to my original letter in the pages that follow.

O-6.4-6 The County states "The Fire Threat Map includes coarse fire environment data and is not relied on for determining whether a project is required to include ignition-resistant building materials and methods". As I explained in my original letter, the Fire Threat Map is a rating of wildland fire threat based on the combination of potential fire behavior and expected fire frequency. Areas between the Project Area and Chula Vista are scored as Very High or Extreme. This is just one piece of evidence demonstrating that an ignition in or around the project footprint under Santa Ana conditions could have devastating impacts to communities down-wind (southwest) of the Project footprint.

O-6.4.7 With regard to the recently-adopted California Public Utilities Commission (CPUC) fire threat map, the County states "There are no additional applications of this fire threat mapping to residential development projects". This is incorrect. I was a co-lead of the Peer Development Panel (PDP) that was tasked by the CPUC with developing the subject CPUC fire threat map. Consequently, I am intimately familiar with how the map was developed, which factors are considered, and whether it is more broadly applicable. The CPUC fire threat map was developed *without consideration of the presence or absence of electrical facilities*, meaning the entire state was mapped even in areas where no utilities are present. The criterion for identifying Tier 3 areas – the designation for the Northern part of the Project Area – is essentially that a fire ignited in this area represents an extreme risk of fire damage to people and improved property elsewhere. For that reason – as with the FRAP Fire Threat Map – the CPUC fire threat map is important evidence that should be considered when assessing potential impacts to downwind communities from fires ignited within the Project Area.

O-6.4-12 In response to my comment that the FPP relied on incorrect wind data in its fire behavior modeling, the County states "No definition of a conventional gust factor is provided, so the commenter's conclusions cannot be verified". Gust factors, which are widely-used in wildland fire risk analysis, are empirically derived equations or graphs that relate wind speed at one averaging interval to wind speed at another averaging interval. A 10-minute average wind speed will be lower than the peak 3-second gust that occurred within that same 10-minute interval.

The "Durst curve"¹ (shown below in Figure 1) is the most commonly-used source of gust factors. As can be seen from the Durst curve, the ratio of 3-second gust wind speed to 10-minute average wind speed (which is what RAWS measures) is approximately 1.43. Therefore, a 40 mph 10-minute average wind speed is expected to have gusts of approximately 57 mph. For that reason, it is inconsistent (and nonconservative) to use a sustained wind speed of 40 mph with a gust of 50 mph as was done in the FPP. Consequently, the County's conclusion that "conservative" wind assumptions were relied upon is incorrect. Using conventional gust factors, a 40 mph 10-minute average wind speed would typically show gusts closer to 60 mph, not 50 mph.

¹ Durst, C.S., "Wind Speed Over Short Periods of Time," *Meteorological Magazine* **89**: 181-187 (1960).

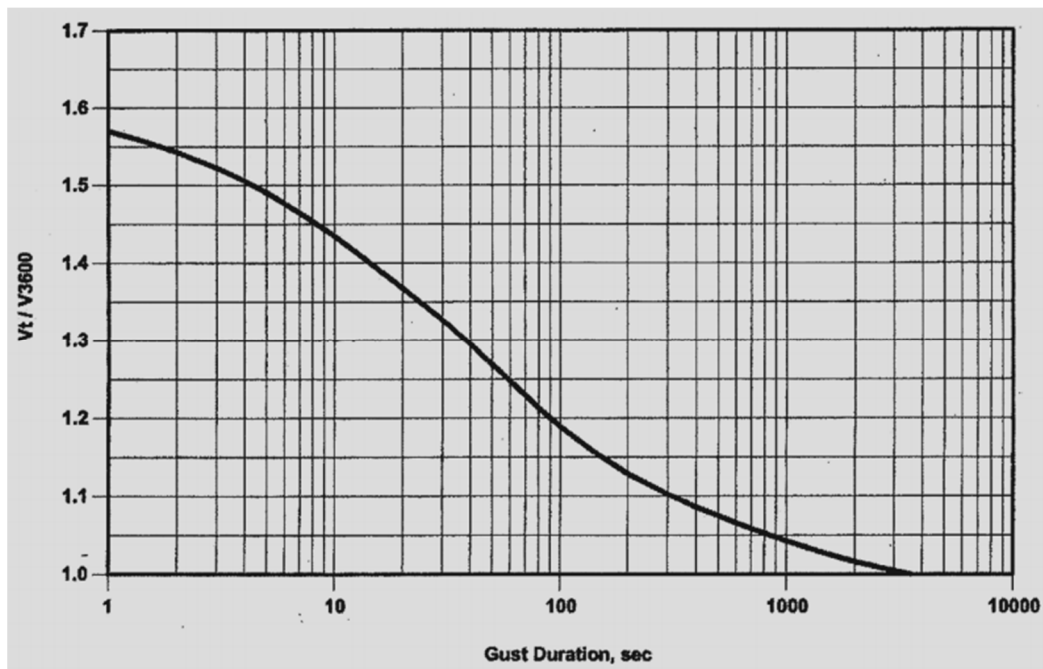


Figure 1. Convention wind gust factors - Durst curve.

O6.4-14 The County states "... the proposed fire station within the Project Area would reduce the response times to wildfire ignitions and increase the likelihood of successful initial attacks that would limit the spread of wildfire." While the presence of a fire station within the Project Area would increase the likelihood of successful initial attack under average summer conditions with little wind, fire history in California has shown that fires occurring under extreme winds frequently cannot be suppressed until winds dissipate.

The County states "... the Fire Protection Plan is intended to outline measures to protect the Proposed Project from adjacent wildland fire hazards." As I have explained, this is a deficiency of the FPP (and EIR) because these documents do not adequately address the Project's potential to expose people or structures outside the Project area to a significant risk of loss, injury or death from fires ignited inside the Project Area. Although the FPP did consider a "buffer" within 300 feet of the Project, it is not the vegetation within this buffer that is relevant for assessing potential impacts to communities downwind, but rather all vegetation that would burn between the Proposed Project and downwind communities if a fire ignited within the Project Area.

O-6.4-18 In response to the comment that the FPP did not consider steep slopes adjacent to the Project footprint and the implication of these slopes on fire behavior and firefighting response, the County states "The detail provided in the comment is insufficient to confirm the provided mapping". The mapping provided is correct and is readily verifiable by a Geographic Information Systems (GIS) analyst or anyone with basic knowledge of GIS. The United States Geological Survey (USGS) openly and freely distributes elevation data. For example, a gridded Digital Elevation Model (DEM) with a spatial resolution of 1/3 arcsecond (approximately 10 m) resolution can be downloaded for the entire project area². Converting this elevation data to

² https://prd-tnm.s3.amazonaws.com/StagedProducts/Elevation/13/ArcGrid/USGS_NED_13_n33w117_ArcGrid.zip

slope is one of the most basic GIS operations and can be easily performed in commercial and open source GIS programs such as ArcGIS or QGIS.

The County response also states with regard to the steeper areas outside of the Project footprint: “These areas typically slope up and away from the Project Area, which does not support the notion that a wildfire would burn faster toward the proposed project.” The County misconstrues my statement. It was never my contention that the high slope areas between the Project Area and Chula Vista would cause a fire to “burn faster toward the proposed project.” It is the opposite: given the steep terrain between the Project Area and Chula Vista, a fire igniting within or near the Project footprint will spread more rapidly toward Chula Vista and be more difficult to suppress than if this terrain was flat. The FPP and EIR do not acknowledge this because they do not even analyze terrain or fuels between the Project area and Chula Vista (outside of the inconsequential 300 ft buffer discussed earlier). Additionally, as the County notes, the high slope areas “typically slope up and away from the Project Area”. This means that Santa Ana winds would blow fire up-slope, increasing spread rate and generating an ember shower downwind.

O-6.4.19 The County’s response acknowledges that “The steepest slopes near the Proposed Project slope up and away from the Project Area, and over 300 feet or more away from the Proposed Project. Firefighters would not be positioned on these slopes...” This only further illustrates my point: a fire that ignites within the Project footprint under Santa Ana winds and spreads outside of the 300 ft buffer would be essentially unsuppressed as it travels through continuous fuels and makes a direct hit on Chula Vista, potentially destroying hundreds of structures.

O-6.4.21 Based on its response, it appears that the County does not agree that slope steepness of land between the Project Area and Chula Vista is relevant for assessing fire spread and control for a fire ignited within the Project area that spreads toward Chula Vista. Again, the EIR and FPP inappropriately focused only on slope and fire behavior in areas immediately adjacent to project parcels as opposed to undeveloped areas > ¼ mile from the Project footprint (*i.e.*, those areas to which a fire ignited within the Project footprint could spread to). The EIR and FPP do not adequately address the role of slope steepness on fire spread and control between the Project Area and Chula Vista, regardless of whether the County considers this out of scope of the FPP and EIR.

It is indisputable that slope increases fire spread rate for fires spreading upslope³. It is also indisputable that slope hinders firefighting efforts. For example, bulldozers cannot be safely operated cross-slope (sidehill) for slopes greater than 35% to 45%. Additionally, uphill/downhill fireline production rates decrease significantly above 40% slope. For example, the fireline production rate of a Type I dozer in Fuel Model 5 drops from 75-100 chains per hour on flat to gently sloping terrain to 20 – 50 chains per hour at slopes above 40%⁴. In order to fully evaluate the Project’s impact on people and structures during a wildfire, the FPP cannot simply dismiss from consideration the steep terrain outside the 300-foot Development Footprint.

O-6.4.29 Because the FPP relied on inaccurate assumptions in its fire behavior modeling, we reran the modeling using accurate and clearly specified input. In response, the County states “No

³ Rothmel, R.C., “A mathematical model for predicting fire spread in wildland fuels,” US Department of Agriculture, Intermountain Forest and Range Experiment Station, Research Paper INT-115 (1972).

⁴ National Wildfire Coordinating Group, “Wildland Fire Incident Management Field Guide,” PMS 210, January 2014.

documentation of the source of the commenter's modeling input variables is provided, so their accuracy cannot be verified." The values used are representative of typical conditions during Santa Ana winds between October and December. The provided inputs are readily verified as being appropriate by anyone with knowledge of fire modeling and Southern California fire weather/climatology.

- O-6.4-30** It appears that the County deliberately misrepresented the points I made in my original letter in which I stated "A range of wind speeds and slopes were analyzed to quantify potential fire behavior *in the areas adjacent to the project footprint* (emphasis added) because one of the biggest fire safety impacts of this project is a fire igniting within the project footprint and spreading to adjacent areas." The analysis presented in my original letter analyzed fire behavior associated with a fire spreading between the Project Area and Chula Vista. For the reasons I explained in my prior letter, and as reiterated above, it is clear that the fire modeling analysis presented in the FPP under-estimates the rate at which a fire igniting within the Project Area would spread toward Chula Vista under Santa Ana winds.

In its response, the County discusses the size of fuel modification zones relative to flame lengths. This has no relevance to the risk associated with a fire igniting within the Project Footprint and spreading toward Chula Vista under Santa Ana winds because fuel modification zones do nothing to prevent fire propagation by firebrand spotting. In other words, the width of a fuel modification zone (~100 ft) is significantly less than the spotting distance of wildland fires burning under strong winds, which may exceed several miles⁵. There are many documented examples of fires in California jumping divided highways and other nonburnable features that are significantly wider than the fuel modification zones being contemplated here. On 8 November 2018, the Woolsey Fire, burning under Santa Ana winds, jumped Highway 101 (approximately 200 ft of pavement) despite firefighters' efforts to stop it there⁶. It ultimately burned over 1,000 structures. The same day, also burning under extreme winds, the Camp Fire in Northern California jumped the West Branch of the Feather River and destroyed over 10,000 structures in Paradise. In 2017, the Tubbs Fire also jumped Highway 101 in Santa Rosa and destroyed thousands of structures.

The County states that "Slope values in the fire behavior modeling in Appendix 3.1.1-2 were derived from direct measurements of site-specific topographic base maps prepared for the Project Area. Fuel model assignments ... are based on site-specific vegetation mapping data coupled with field-based observations". The FPP and EIR did not assess slope values or surface fuels in the area between the Project Area and Chula Vista. *It is fuels and topography between the Project Area and Chula Vista – not within the project footprint – that is relevant for assessing potential impacts to adjacent communities such as Chula Vista.*

The County also states that my analyses "... do not justify the assertion that Appendix 3.1.1-2 underestimated potential fire behavior for the Project Area." This is not an accurate characterization of the conclusion in my original letter, which stated "...it is concluded the FPP underestimates potential fire behavior in the areas *adjacent to the project parcels*" (emphasis added).

- O-6.4-32** The County's response states "Although it is true that humans are the cause of fires in California, there is no data available that links increases in wildfires with the development of

⁵ Koo, E., Pagni, P.J., Weise, D.R., and Woycheese, J.P., "Firebrands and spotting ignition in large-scale fires," *International Journal of Wildland Fire* **19**: 818–843 (2010).

⁶ <https://www.latimes.com/local/lanow/la-me-woolsey-fire-spread-20181113-story.html>

ignition-resistant communities.” However, the converse is also true: there are no data showing that ignition-resistant communities don’t increase wildfire ignitions.

Common sense dictates that even ignition-resistant communities increase the probability that an ignition occurs relative to undeveloped area. One reason for this is that the concept of an “ignition-resistant community” has to do primarily with reduced ignitability of structures within that community from external sources, not reduced likelihood of a fire igniting within that community and spreading to other (possibly non-ignition-resistant) communities.

Ignition-resistant homes with 1-hour fire resistant exterior walls⁷ do nothing to prevent, for example, a battery explosion in an electric vehicle from igniting vegetation under Santa Ana winds and destroying hundreds of homes in Chula Vista. Nor do screens covering end gable vents prevent children playing with matches or fireworks from accidentally igniting a similarly damaging fire. However, what would prevent those types of fires from occurring is not having structures, vehicles, and people in places that are currently largely uninhabited such as the project footprint. A vegetation or structure fire ignited in an ignition resistant community under Santa Ana winds can certainly propagate beyond the Project footprint, either by flame spread or ember spotting, even if fuel modification zones are present. It is disingenuous for the EIR to suggest that the use of ignition-resistant building materials or fuel modification zones would begin to compensate for the Project’s location within a very high fire hazard severity zone (see pages RTC-505, 506, (response 0-6.4-6) which states: “This [VHFHSZ] designation indicates that the area includes a fire environment that is conducive to periodic wildfires, but does not consider fire reduction activities like conversion of fuels with development or fuel modification zones.”)

The County responds that “The San Diego County Fire Authority ... disagrees that the Proposed Project presents a fire risk to ... to residents in Chula Vista. The Proposed Project would provide additional buffers for the existing community to the west/southwest. This type of dense development with an unbroken landscape (as opposed to low-density wildland/urban intermix projects) has been found to perform well against wildfires.” The FEIR provides no evidence to support this statement.

Despite the San Diego County Fire Authority’s assertion, the Proposed Project – with 100% certainty – increases the risk of structure loss and loss of life in adjacent communities due to the increased probability of ignition it presents. In addition, contrary to the County’s claims, there is a large amount of empirical evidence demonstrating that “dense development” does not always perform well against wildfires. Two examples are provided below.

In October 2017, the wind-driven Tubbs fire destroyed thousands of structures in Santa Rosa – including a Kmart – a location that would be considered to be “dense development”. The Coffey Park neighborhood was almost completely destroyed. Figure 2 shows a satellite image of Coffey Park pre-fire, and Figure 3 is an analogous image post-fire showing hundreds of destroyed homes.

In December 2017, the Thomas Fire – driven by Santa Ana winds – damaged or destroyed 644 residences, 4 commercial structures, and one infrastructure building in dense development in

⁷ Fire resistant construction is rated according to the time at which it passes a standard fire resistance test such as ASTM E-119 wherein construction elements are exposed to high temperature. A 1-hour rated wall passes the standardized fire resistance for a duration of 60 minutes.

the City of Ventura⁸. The joint damage inspection report with participants from the US Forest Service, Ventura County Fire Department, CAL FIRE, and others included data showing that the majority of these damaged or destroyed structures had fire resistant roof construction (97%) and fire resistant exterior siding (92%)⁸. Figure 4 shows an area of dense development in Ventura pre-fire, and Figure 5 shows high density development post-fire with dozens of destroyed structures evident. Figure 6 shows a section of the Bella Lago neighborhood in Chula Vista to facilitate comparison with similar dense development areas that were decimated in the Tubbs and Thomas Fires.

⁸ Mitchell, C., Pivaroff, N., Mepani, V., and Meyer, T., “Thomas Incident Damage Inspection Report,” CAVNC 103156



Figure 2. High density development in Coffey Park in prior to Tubbs Fire.



Figure 3. High density development in Coffey Park after Tubbs Fire.



Figure 4. High density development in the City of Ventura prior to Thomas Fire.



Figure 5. High-density development in the City of Ventura after Thomas Fire.



Figure 6. Satellite image of Bell Lago neighborhood in Chula Vista.

O-6.4.33 In response to my comment that a fire ignited within the Project footprint could spread to adjacent communities, the County states “There are currently populated areas (Jamul, Spring Valley, Rancho San Diego, and Campo Road [SR-94]) to the north/northwest of the portion of Chula Vista the comment refers to. These areas present human-related ignition sources with a consistent fuel bed between them and Chula Vista.” The argument appears to be that, because populated areas (which increase ignition likelihood) are already present, it’s acceptable to add more population and increase ignition risk even further. This is like arguing that because a river is already polluted, it’s acceptable to dump even more pollution into the river. It is the purpose of this FPP and the EIR to evaluate the increase in fire risk from this Project, not from existing development.

The County’s response states “The Proposed Project would provide an ignition-resistant landscape that essentially breaks up fuel continuity; provides operational advantages, including anchor points; and offers temporary refuge for firefighters and citizens.” While the factors identified by the County may be relevant to defending a fire spreading toward the Project Area, none of those factors have anything to do with the increased probability of a fire igniting within the project footprint and spreading toward adjacent communities, including Chula Vista.

O-6.4-34 For the reasons that I have explained previously, it is demonstrably false that there is not “an increased risk from the Proposed Project to adjacent developed areas that is greater than the existing condition.” Furthermore, the EIR provides no scientific evidence that projects such as the one proposed here would “improve fire safety.”

O6.4-36 In response to my comment that a fire ignited within the Project footprint would impact downwind communities under Santa Ana wind conditions, the County asserts that my opinion is unsubstantiated and therefore requires no response. To the contrary, there is ample evidentiary support that under high winds, one of the primary mechanisms through which fires spread downwind is by spotting and firebrand showers⁹. In high wind conditions in California,

⁹ Caton, S.E., Hakes, R.S.P., Gollner, M.J., Gorham, D.J., and Zhou, A., “Review of Pathways for Building Fire Spread in the Wildland Urban Interface Part I: Exposure Conditions,” *Fire Technology* **53**: 429-473 (2017).

fires have been known to spot miles ahead of the fire front, cross six lane highways, and jump large rivers. The presence or absence of fire resistant structures (in Village 14, for example) would have *no effect* on the ability of fires to spread downwind by firebrand spotting. Under high winds, a fire would simply spot over (jump) any fire resistant construction in its path because the spotting distance is much greater than the size of the Project footprint. Again, the presence or absence of Village 14 would have no impact on the spread of a fire ignited within the Project Area from spreading toward adjacent communities including Chula Vista.

Furthermore, the issues raised in my comments are directly relevant to the adequacy of the FPP's and EIR's analysis of the Project's potential to pose a risk to individuals and structures from wildfire. For the myriad reasons I have explained in my prior letter and in this letter, the County's analysis is inadequate and substantially understates the Project's potential impacts. Consequently, the County has a duty to respond to these comments.

O6.4-38 The County states "Because the comment erroneously states that the Wildland Fire Evacuation Plan did not contemplate and evaluate a potential scenario where evacuation to the north on Proctor Valley Road is not possible, the comment requires no additional response". Here too, the County appears to have intentionally mischaracterized my original comment – which was not erroneous – which stated: "Proctor Valley Road runs approximately Northeast / Southwest and is therefore almost perfectly aligned with the wind direction under Santa Ana wind conditions (recall that Santa Anas blow from the Northeast toward the Southwest). Consequently, a fire traveling from Jamul toward the project footprint from the Northeast, or starting within the North part of the project footprint, *may block large stretches of Proctor Valley Road simultaneously* (emphasis added). This is not addressed in the FPP or EIR's evacuation plan."

It was never my contention that the FPP did not address the scenario where evacuation to the North on Proctor Valley Road is not possible – rather, it was (and remains) my contention what the FPP and EIR did not address the scenario where, due to the alignment of Proctor Valley Road with the predominant Santa Ana wind direction fire blocks "large stretches of Proctor Valley Road simultaneously" – meaning evacuation to the North *and South* is not possible. The only possible outcome under this scenario is a shelter in place scenario where several thousand residents "wait it out". This could be successful, or in a worst-case scenario, it could result in dozens of fatalities, particularly among the old, the young, the infirm, and the disabled. The EIR's failure to disclose these potentially severe consequences from a "contingency" scenario that calls for sheltering in place would appear to be intentionally deceptive.

The WFEP (page 5) states that evacuation procedures should be updated with lessons learned from actual evacuation events, as they were following the 2003, 2007, and 2014 San Diego County fires. The 2017 and 2018 California wildfires have been the most destructive wildfire seasons on record in California. The County has a duty to take into account these recent wildfires in its analysis of Project-related risk.

Sincerely,



Christopher W. Lautenberger, PhD, PE